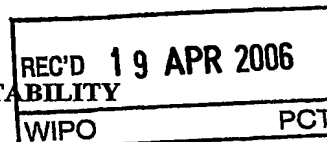


## PATENT COOPERATION TREATY

## PCT



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference PCT-E4176	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. <b>PCT/KR2004/002806</b>	International filing date(day/month/year) <b>03 NOVEMBER 2004 (03.11.2004)</b>	Priority date (day/month/year) 26 NOVEMBER 2003 (26.11.2003)
International Patent Classification (IPC) or national classification and IPC  <b>C07D 209/42(2006.01)i</b>		
Applicant  <b>SK CORPORATION et al</b>		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
  - ☒ Box No. I Basis of the report
  - ☐ Box No. II Priority
  - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Box No. IV Lack of unity of invention
  - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Box No. VI Certain documents cited
  - ☐ Box No. VII Certain defects in the international application
  - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand  <b>15 APRIL 2005 (15.04.2005)</b>	Date of completion of this report  16 MARCH 2006 (16.03.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  KIM, Hee Sue Telephone No. 82-42-481-5605 

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002806

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
  
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☒ the international application as originally filed/furnished
  
  - ☐ the description:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  
  - ☐ the claims:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  
  - ☐ the drawings:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  
  - ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
  
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
  
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002806

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-14	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-14	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims	None	NO

### 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: EP 0197474 A1

D2: JP 06-16718 B2

D3: JP 61-92595 A1

D4: JP 07-79711 B2

D5: JP 07-79712 B2

The present invention relates to the preparation methods of (S)-indoline-2-carboxylic acid and methyl ester thereof using hydrolytic enzymes which can be used as an intermediate of a therapeutic agent for treatment of hypertension.

D1 relates to a process for preparing optically active indoline-2-carboxylic acid by hydrolyzing the racemic ester of (R,S)-indoline-2-carboxylic acid by means of an enzyme such as Bacillus and Aspergillus.

D2 discloses a method for preparing optically active indoline-2-carboxylic acid by using immobilized enzymes such as Bacillus and Aspergillus.

D3 describes a method for preparing optically active indoline-2-carboxylic acid ester by using enzymes like Bacillus and Aspergillus.

D4 relates to a process for preparing optically active indoline-2-carboxylic acid by using immobilized enzymes such as Aspergillus and Pseudomonas.

D5 relates to a process for preparing optically active indoline-2-carboxylic acid by an optical resolution.

#### 1. Novelty

The subject matter of the present claims 1-14 is novel over the above D1-D5 and meets the criteria set out in PCT Article 33(2), because none of the prior art describes a method for preparing (S)-indoline-2-carboxylic acid and methyl ester thereof by reacting racemic indoline-2-carboxylic acid with methanol and thionyl chloride by means of a hydrolytic enzyme recited in the present claims.

See Supplemental Box for the next parts.

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of:

Box V.

**2. Inventive step**

The subject matter of the present claims 1-14 complies with PCT Article 33(3), since the prior art including the above D1-D5 does not teach or fairly suggest the following features: having a very high optical purity of at least 99%e.e.; simplifying preparation process; and having high preparation efficiencies by reacting racemic indoline-2-carboxylic acid with a low molecular weight alcohol, methanol, and thionyl chloride by means of a hydrolytic enzyme which is selected from the group consisting of Savinase, Alcalase, Novozym 243, Everlase, Esperase, Protease 7 and Acylase.

**3. Industrial applicability**

Claims 1-14 meet the criteria set out in PCT Article 33(4) and consequently, these claims are considered to be industrially applicable.

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